

# *Multifunctional Materials for Intelligent and Autonomous Systems*

**Bo Mi Lee**

**Assistant professor of Mechanical and  
Aerospace Engineering  
Missouri S&T**



**Chemistry  
Seminar on  
Advanced  
sensing  
technologies**

**Monday  
October 6 at  
4 pm in 126  
Schrenk**

**Please contact  
Dr. Amitava  
Choudhury at  
[choudhurya@mst.edu](mailto:choudhurya@mst.edu)  
for further  
information.**

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**Abstract:** Intelligent and autonomous systems, characterized by their ability to operate independently or interact seamlessly with humans, are revolutionizing fields ranging from manufacturing to healthcare. These systems integrate artificial intelligence, robotics, and advanced sensing technologies to function autonomously, performing tasks without human intervention or in collaboration with humans. A key component of these systems is advanced sensing technologies, which serve as their ‘eyes and ears’, enabling real-time monitoring for adaptive responses.

The objective of this seminar is to explore the design and implementation of multifunctional materials to enhance these sensing technologies in intelligent and autonomous applications. These materials are foundational in developing innovative sensors, offering new dimensions in system intelligence and autonomy. We will discuss the current challenges in understanding multifunctional materials and how computational models, derived from multi-scale experimental measurements, aid in addressing these challenges. The presentation will showcase the use of these models in designing new sensors for applications in manufacturing equipment monitoring. Additionally, we will explore the assembly of advanced materials using additive manufacturing, specifically for creating sensors designed for potential wound monitoring applications. The session will also cover the analysis of complex sensing responses using machine learning algorithms, emphasizing the synergy between material innovation and computational intelligence.

**About the speaker:** Dr. Bo Mi Lee joined the Department of Mechanical and Aerospace Engineering at the Missouri University of Science and Technology as an assistant professor in 2024. Prior to this, Dr. Lee was a postdoctoral associate at the University of Central Florida and the University of California, Davis. Dr. Lee received her Ph.D. in Structural Engineering from the University of California, San Diego, in 2019. She was the recipient of the UCF Pre-eminent Postdoctoral Program (P3) Award, the Rising Stars Women in Engineering from the 2019 Asian Dean’s Forum, the Best Paper Award from ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS) in 2018, and a dissertation fellowship from UC San Diego in 2019, among others. In addition, her paper was selected as a 2017 highlight by IOP Publishing. Her current research interests include multifunctional materials, stimuli-responsive nanocomposites, and data-driven approaches to advance sensor technologies, biomedical applications, and actuation systems.